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| **TITLE:** | **Raspberry Pi Telephone Blocker (IceBl0ck) INSTRUCTION MANUAL** | |  |
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Summary

This document has been produced for the IceBl0ck project which is a telephone blocker for the Raspberry Pi (Rpi). IceBl0ck is primarily intended to be a kit which is assembled by the user and attached to a Raspberry Pi small computer.

Controlling the hardware is the IceBl0ck application software (APSW) which is loaded when the Rpi boots.  
  
This document details the instructions of how to exercise the various features of the kit once it is assembled and connected to a RPi.  
  
Detailed assembly instructions and user guides can be found in the following documents:

* IceBl0ck User Guide.
* IceBl0ck Assembly Instructions.
* IceBl0ck Requirements.

A list of actions to be performed by the user to show the full extent of the IceBl0ck features are given which will serve as an ideal introduction for the user and potential demonstrations of the IceBl0ck kit and software.

IceBl0ck features:

* Automatic answering and dropping depending on the user specified action for the incoming telephone number
* Allow telephone numbers during certain start date, end date, start time, end time and days of the week
* User specified text e,g, WITHHELD or telephone number
* Text To Speech (TTS) for automated messages to the caller
* Text To Speech for automated messages to the user via Bluetooth (BT) speaker
* Say the calling telephone number (TTS to BT speaker) with 3 different speeds
* User defined menu system using TTS and telephone keypad tones (Dual Tone Multi Frequency - DTMF)
* User specified TTS espeak parameters embedded in the message to control speed and frequency (e.g. male/female) of voice
* Detection of “robots” by asking the caller to press a random key and if there is no response or the wrong key, IceBl0ck hangs up
* Say user specified pre-recorded waveform audio (.WAV) sound files to the caller
* Say user specified pre-recorded .wav sound files to the user (BT speaker)
* Optionally play Special Information Tone (SIT) .wav sound files to the caller followed by a user defined TTS or pre-recorded message
* Say a random message to the caller (message is selected from a user specified list of messages)
* Logging of telephone numbers with date/time (obtained from Caller ID)
* A catch all ‘\*’ telephone number provides a default action for unknown numbers

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Abbreviations

|  |  |
| --- | --- |
| App | Application |
| APSW | Application Software |
| BT | Bluetooth |
| BT socket | British Telecommunications wall socket |
| CID | Caller Identification |
| CLID | Calling Line Identification |
| CLIP | Calling Line Identification Presentation |
| CND | Calling Number Delivery |
| CNID | Calling Number Identification |
| DTMF | Dual Tone Multi Frequency |
| GUI | Graphical User Interface |
| H/W | Hardware |
| INS | Instruction |
| I/O | Input / Output |
| OS | Operating System |
| RPi | Raspberry Pi |
| S/W | Software |
| TTS | Text To Speech |
| UG | User Guide |
| UK | United Kingdom |
| WAV | Waveform Audio File Format |
| Wi-Fi | Any device that conforms to IEEE 802.11 wireless standard |

References / Applicable Documents

**Note: Unless otherwise specified, always refer to the latest issued document.**

|  |  |  |
| --- | --- | --- |
| **Ref No** | **Document Title** | **Document No** |
| 1. | IceBl0ck Requirements Specification | NS\_RS\_RPI\_ICEBL0CK\_001  Issue: 1.00 |
| 2. | IceBl0ck User Guide | NS\_UG\_RPI\_ICEBL0CK\_001  Issue: 1.00 |
| 3. | IceBl0ck Assembly Guide | NS\_AG\_RPI\_ICEBL0CK\_001  Issue: 1.00 |

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# Introduction

This document lists a number of steps to be performed by the user to demonstrate the features of the IceBl0ck telephone blocker for the RPi.

It is recognised that editing a text file is tedious and unintuitive for the user so an Android App providing a GUI to create the database file is being developed. The communication between the App and IceBl0ck will be via Wi-Fi.

IceBl0ck comprises of the following parts:

* PCB
* 56K Voice Modem
* RPi connector
* Terminal block connector
* Bluetooth USB dongle
* SD card containing OS and APSW

A full IceBl0ck system is required to demonstrate all features. A full system comprises of an IceBlock kit, RPi and accessories as detailed below

* IceBl0ck kit
* RPi small computer (RPi 2 B)
* RPi compatible case (Cyntech RPi 2 cases are recommended)
* RPi power supply (1.2A or above recommended)
* HDMI lead connected to a TV or monitor
* Telephone socket with the Caller ID\* service enabled
* Wi-Fi dongle is optional

Detailed technical information is provide in the User Guide (Ref. 2) and Assembly Instructions (Ref. 3) documents.

\*Note: CID is sometimes called Calling Line Identification (CLID), Calling Number Delivery (CND), Calling Number Identification (CNID) or Calling Line Identification Presentation (CLIP).

## Intended Audience

This document is intended for:

* End user as a initial guide to all of IceBl0ck features
* OEM companies for evaluation purposes

# Feature Demonstration

In the following steps, please replace <n> with your telephone number you wish to be detected e.g. the mobile number you’re using to perform the steps.

When IceBl0ck detects an incoming call, the database is searched and the first telephone number in the database that matches the CID will be used to perform its specific action.

For example, 0770123456/01 will make IceBl0ck answer the telephone when the number 0770123456 is detected in the CID and will immediately hang up as action 01 is “Pick up then hang up”.

Please see the “ccc\_db.txt” database file for all actions. Please note, not all actions listed in the database file are implemented but all actions detailed below are.

All actions below have a suitable entry in the database file provided which may be uncommented and changed. The ‘#’ character as the first character on a line is used to define the start of a comment.

## Do nothing

On matching an incoming telephone number with one in the database which has this action defined, IceBl0ck will do nothing which lets the telephone ring normally.

Enter the following as the first occurance of <n> in the database file “ccc\_db.txt”

<n>/00

Ring the telephone number that IceBl0ck is connected to. IceBl0ck should not answer the telephone.

## Pick up then hang up

On matching an incoming telephone number with one in the database which has this action defined, IceBl0ck will answer the telephone and immediately hang up.

Enter the following as the first occurance of <n> in the database file “ccc\_db.txt”

<n>/01

Ring the telephone number that IceBl0ck is connected to. IceBl0ck should answer the telephone and immediately hang up.

## Play pre-recorded message

On matching an incoming telephone number with one in the database which has this action defined, IceBl0ck will answer the telephone then play the specified .wav file. Either one or two .wav files may be specified to allow for a SIT message followed by a user message to be played.

Enter the following as the first occurance of <n> in the database file “ccc\_db.txt”

<n>/02/”number\_temp\_unavailable.wav”

Ring the telephone number that IceBl0ck is connected to. IceBl0ck should answer the telephone and then play the pre-recorded file to you over the telephone.

## Allow call using dates

On matching an incoming telephone number with one in the database which has this action defined, IceBl0ck will allow the telephone to ring if the current date and time is between the specified start and end date/time. Also, if the user has specified one or more days then the call will only be allowed during those days.

Enter the following as the first occurance of <n> in the database file “ccc\_db.txt”

<n>/04/01,010815,1300,300815,2000

This entry will “pick up and then hang up” if the current date/time is between 1st August 2015, 13:00 hours and 30th August 2015 20:00 hours.

|  |  |
| --- | --- |
| **Value** | **Meaning** |
| 04 | The “Allow call using dates” action number |
| 01 | The “Pick up and hang up” action number |
| 010815 | The start date 01/08/15 |
| 1300 | The start time 13:00 hours |
| 300815 | The end date 30/08/15 |
| 2000 | The end time 20:00 hours |

Table : Date and Time entry

Ring the telephone number that IceBl0ck is connected to. IceBl0ck should answer the telephone and then hang up.

The date/time from the CID is compared to the database entry to check if it is between the start and end date/time.  
If it is between the date/time then the action is performed which in this case is to hang up.

Also, you may specify the days (comma separated list) which the telephone number is valid in addition to the start date/time e.g.

<n>/04/01,010815,1300,300815,2000,mon,end

IceBl0ck would perform the action if the date is between the start and end date/time and the day is a Monday or it is Saturday or Sunday (Weekend).

Valid entries for the day’s field are:

|  |  |
| --- | --- |
| **Value** | **Meaning** |
| mon | Monday |
| tue | Tuesday |
| wed | Wednesday |
| thu | Thursday |
| fri | Friday |
| sat | Saturday |
| sun | Sunday |
| day | Weekday so any of Monday...Friday will match |
| end | Weekend so either Saturday or Sunday will match |

Table : Valid Day entry

## Caller TTS

On matching an incoming telephone number with one in the database which has this action defined, IceBl0ck will answer the telephone and play the specified TTS message to the caller. The user may specify a .wav file first to allow for a SIT message followed by a TTS message to be played.

Enter the following as the first occurance of <n> in the database file “ccc\_db.txt”

<n>/05/”sit.wav”,”/-k20 –a200 -s120/Option 5 works”

Ring the telephone number that IceBl0ck is connected to. IceBl0ck should answer the telephone and then play the SIT message followed by the TTS message “Option 5 works” over the telephone.

Optionally, you may enter espeak parameters as part of the TTS message. Anything between the ‘/’ characters is interpreted by IceBl0ck as parameters for espeak.

Settings such as capital letters (-k), volume (-a) and number of words per minute (-s) and any supported option is configurable.

A male or femal voice may be specified using the parameter +m1 to +m7 for male voices and +f1 to +f4 for female voices. A complete list of options is available at <http://espeak.sourceforge.net/commands.html>

## Bluetooth TTS

On matching an incoming telephone number with one in the database which has this action defined, IceBl0ck will play the specified TTS message on the Bluetooth speaker. A pre-recorded .wav file may be optionally specified which will play immediately before the TTS message.

Enter the following as the first occurance of <n> in the database file “ccc\_db.txt”

<n>/08/”/-k20 –a200 -s120/Option 8 works”

Ring the telephone number that IceBl0ck is connected to. IceBl0ck should say the TTS message “Option 8 works” on the Bluetooth speaker.

Please see section 2.5 for possible espeak parameters.

## Bluetooth pre-recorded

On matching an incoming telephone number with one in the database which has this action defined, IceBl0ck will play the specified pre-recorded .wav file on the Bluetooth speaker. A second pre-recorded .wav file may be optionally specified which will play immediately after the first file.

Enter the following as the first occurance of <n> in the database file “ccc\_db.txt”

<n>/09/”cid\_on.wav”

Ring the telephone number that IceBl0ck is connected to. IceBl0ck should play the pre-recorded cid\_on.wav file on the Bluetooth speaker.

## Bluetooth telephone number

On matching an incoming telephone number with one in the database which has this action defined, IceBl0ck will say the incoming telephone number to the Bluetooth speaker. Options of no, short or long pause between numbers may be specified.

Enter the following as the first occurance of <n> in the database file “ccc\_db.txt”

<n>/10/0

Ring the telephone number that IceBl0ck is connected to. IceBl0ck should say the incoming telephone number on the Bluetooth speaker without any delay between the digits.

The delay between digits is configurable by specifying different values:

|  |  |
| --- | --- |
| **Value** | **Meaning** |
| 0 | No delay |
| 1 | Short delay |
| 2 | Long delay |

Table : Say Telephone parameters

## Automated menu

On matching an incoming telephone number with one in the database which has this action defined, IceBl0ck will say the specified main menu pre-recorded or TTS message and detect any DTMF keypad key pressed by the caller. The key is validated and its action performed. Valid actions include play another message (allowing the user to have multiple menus) or to say a TTS or pre-recorded message to the Bluetooth speaker (e.g. allow IceBl0ck to announce who the call is for).

Enter the following lines in the database file (if they are not already there):

COM 001,TTS,"/-k30 -a200 -s110/Press 0 for John, 1 for Elaine, 2 for anyone, hash to hear message again","m0.wav",0-002,1-003,#-001,2A003

COM 002,TTS,"/-k30 -a200 -s110/0 to ring John, 1 for main menu, hash to hear message again","m0\_1.wav",1-001,#-002,0A001

COM 003,TTS,"/-k30 -a200 -s110/0 to ring Elaine, 1 for main menu, hash to hear message again","m0\_2.wav",1-001,#-003,0A002

COM 004,"pre\_recorded1.wav",1-001,#-004,0A003

ACT 001/08/"/-k30 -a200 -s110/John, phone for you"

ACT 002/08/"/-k30 -a200 -s110/Elaine, phone for you"

ACT 003/08/"/-k30 -a200 -s110/Anyone, pick up the phone"

ACT 004/09/"pre-recorded2.wav"

The commands above creates a main menu (COM 001) using TTS and stores it in the file m0.wav. When the caller presses 0 on their keypad, COM 002 is played (1-002). When the caller presses 1 on their keypad, COM 003 is played. When the caller presses # on their keypad, COM 001 is played again (#-001). When the caller presses 2 on their keypad, ACTion 003 is performed which in this case is to say “Anyone, pick up the phone” to the Bluetooth speaker.

Enter the following as the first occurance of <n> in the database file “ccc\_db.txt”

<n>/12/001

Ring the telephone number that IceBl0ck is connected to. IceBl0ck should say/play the message that has previously been defined as COMmand 001 in the database file. In this case, COMmand 001 is the main menu.

When an action is played, IceBl0ck will wait for 30 seconds before hanging up the telephone. The 30 seconds is to allow the user to answer the call on their normal telephone before IceBl0ck hangs up.

## Robot detector

On matching an incoming telephone number with one in the database which has this action defined, IceBl0ck will ask the caller to press a random number on their keypad (0-9, \* or #). If there is no key pressed within a few seconds, IceBl0ck will hang up. If the wrong key is pressed then IceBl0ck will announce an “incorrect key” TTS message and hang up. If the key pressed is the correct one then IceBl0ck will announce a “valid key” TTS message to the caller then say “A validated caller is on the line” to the Bluetooth speaker.

If the Bluetooth speaker turns itself off (power down mode to conserve battery) then please press the power button before running these steps:

Enter the following as the first occurance of <n> in the database file “ccc\_db.txt”

<n>/13

Ring the telephone number that IceBl0ck is connected to. IceBl0ck should ask the caller to press a number (IceBl0ck picks this randomly using the Pi’s onboard random number generator hardware) on their keypad and verifies the press as described above.

## Random message

On matching an incoming telephone number with one in the database which has this action defined, IceBl0ck will select a message at random from the user specified list of messages. Messages may be TTS or pre-recorded.

Enter the following lines in the database file (if they are not already there) :

COM 010.TTS,"/-k30 -a200 -s120/I asked god for a bike, but he does not work that way. so i stole a bike and asked for forgiveness.","rnd001.wav"

COM 011.TTS,"/-k30 -a200 -s120/Light travels faster than sound. This is why some people appear bright, until they speak.","rnd002.wav"

COM 012.TTS,"/-k30 -a200 -s120/What did the fish say when he swam into the wall, , dam.","rnd003.wav"

COM 013.TTS,"/-k30 -a200 -s120/Which side of a chicken has the most feathers, , The outside.","rnd004.wav"

These COMmand lines create .wav file for each command and assigns them a number which in this case is 10, 11, 12 and 13.

Enter the following as the first occurance of <n> in the database file “ccc\_db.txt”

<n>/14/010,013

Ring the telephone number that IceBl0ck is connected to. IceBl0ck should play one of the messages between COMmand 10 and 13 at random and then hang up.

## Variables

Variables (VAR) are used in the database file to specify global options to IceBl0ck. Available variable names are:

* TTS  
  0 : espeak is to be used for TTS  
  1 : pico2wave should be used for TTS
* APPEND  
  0 : do not append unmatched telephone numbers to the database  
  1..9 : append any unmatched telephone numbers and CID information to the database with an action of Do Nothing.
* VOL  
  001..255 : Volume of the outgoing message to the caller. A value of 1 is the quietest and a value of 255 is the loudest.

## Commands

Commands (COM) are used in the database file to instruct IceBl0ck to create TTS .wav files before any incoming calls are monitored e.g. for use with the “Automated menu” option.

## Actions

Actions (ACT) are used in the database file to instruct IceBl0ck to store the actions for use with the “Automated menu” option.

Telephone socket

RPi with IceBl0ck fitted

Telephone cable

Plug the IceBl0ck telephone cable into a BT socket.

The telephone line must have the Caller ID service enabled for IceBl0ck to function correctly.

Figure : IceBl0ck setup

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| **END OF DOCUMENT** |